WHAT IS CLAIMED IS:

1. A method of forming a dielectric layer of a semiconductor device, comprising the steps of:

growing an oxynitride layer of a semiconductor device; and

annealing the oxynitride layer at a temperature of about 400°C for about 20 minutes.

2. The method of claim 1, wherein the annealing is performed in a nitrogen ambient or a nitrogen ambient including an oxygen concentration of less than about 1 part per billion.

3. The method of claim 1, wherein the oxynitride layer is grown to a thickness in a range of about 12 to about 24 angstroms.

4. The method of claim 1, further comprising the step of:

capping the annealed oxynitride layer with a gate, wherein the gate is silicon, polysilicon, germanium, silicon-germanium, any other semiconductor material, or a metal.

5. The method of claim 4, wherein the metal is aluminum.

6. The method of claim 4, wherein the growing of the oxynitride layer is carried out by using a plasma nitridation process.

7. A Field Effect Transistor having a gate dielectric, wherein the gate dielectric is formed using the method of claim 1.

8. A capacitor having a dielectric layer, wherein the dielectric layer is formed using the method of claim 1.

9. A MIM capacitor having a dielectric layer, wherein the dielectric layer is formed using the method of claim 1.

10. A method of forming a dielectric layer within a semiconductor device, comprising the steps of:

growing an oxynitride layer on a semiconductor device;

annealing the oxynitride layer at a temperature of about 400°C for about 20 minutes, wherein the annealing is performed in a nitrogen ambient including an oxygen concentration of less than about 1 part per billion; and

capping the annealed oxynitride layer with a gate.

11. The method of claim 10, wherein the gate is silicon, polysilicon, germanium, silicon-germanium, any other semiconductor material, or a metal.

12. The method of claim 11, wherein the metal is aluminum.

13. The method of claim 10, wherein the growing of the oxynitride layer is carried out by using a plasma nitridation process.

14. The method of claim 10, wherein the annealing further comprises preheating the semiconductor substrate to a temperature of about 400°C.

15. A Field Effect Transistor having a gate dielectric, wherein the gate dielectric is formed using the method of claim 10.

16. A method for forming a dielectric layer on a semiconductor device, comprising the steps of:

growing an oxynitride layer on a semiconductor device in a processing chamber;

preheating the semiconductor device to a temperature of about 400°C;

annealing the oxynitride layer for about 20 minutes at a temperature of about 400°C; and

cooling the semiconductor device with the annealed oxynitride layer.

17. The method of claim 16, wherein the preheating step is performed for about 4 minutes.

18. The method of claim 16, wherein the cooling step is performed for about 4 to 10 minutes.

19. The method of claim 16, wherein the cooling step is performed until the semiconductor device is at a temperature in a range of about 25 to about 300°C.

20. The method of claim 16, wherein the annealing is performed in a nitrogen ambient or a nitrogen ambient including an oxygen concentration of about 1 to about 10 parts per billion.

21. The method of claim 16, wherein the oxynitride layer is grown to a thickness in a range of about 12 to about 24 angstroms.

22. The method of claim 16, further comprising the step of:

capping the annealed oxynitride layer with a gate.

23. The method of claim 22, wherein the gate is silicon, polysilicon, germanium, silicon-germanium, any other semiconductor material, or a metal.

24. The method of claim 23, wherein the metal is aluminum.

25. The method of claim 16, wherein the growing of the oxynitride layer is carried out by using a plasma nitridation process.

26. A Field Effect Transistor having a gate dielectric layer, wherein the gate dielectric layer is formed using the method of claim 16.

27. A capacitor having a dielectric layer, wherein the dielectric layer is formed using the method of claim 16.

28. A MIM capacitor having a dielectric layer, wherein the dielectric layer is formed using the method of claim 16.

29. A method of forming a dielectric layer of a semiconductor device, comprising the steps of:

growing an oxynitride layer of a semiconductor device;

depositing a gate electrode layer on the oxynitride layer; and

annealing the oxynitride layer and gate electrode layer at a temperature of about 400°C for about 20 minutes.

30. The method of claim 29, wherein the annealing is performed in a nitrogen ambient including an oxygen concentration of about 1 to about 10 parts per billion.

31. The method of claim 29, wherein the oxynitride layer is grown to a thickness in a range of about 12 to about 24 angstroms.

32. The method of claim 29, wherein the growing of the oxynitride layer is carried out by using a plasma nitridation process.

33. The method of claim 29, wherein the annealing is performed in a nitrogen ambient including an oxygen concentration of less than about 1 part per billion.

34. The method of claim 29, wherein the gate electrode layer is silicon, polysilicon, germanium, silicon-germanium, any other semiconductor material, or a metal.